

We claim:

943
A1
1. A method for attaching a semiconductor die to a leadframe:

5 dispensing an adhesive material on the leadframe, said adhesive material formulated to cure in from about 0.25 seconds to 60 seconds;

placing the die in contact with the adhesive material; and

10 polymerizing the adhesive material to form a cured adhesive layer and bond the die to the leadframe.

2. The method as claimed in claim 1 wherein the adhesive material comprises a material selected from the group consisting of cyanoacrylates, anaerobic acrylics or the like.

3. The method as claimed in claim 1 further comprising applying a catalyst to the leadframe, die or adhesive material to initiate the polymerizing step.

4. The method as claimed in claim 1 wherein the leadframe includes a mounting paddle.

5. The method as claimed in claim 1 wherein the leadframe comprises a lead-on-chip leadframe.

6. A method for attaching a semiconductor die to a leadframe:

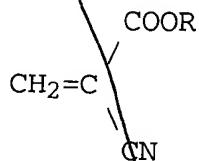
30 providing the leadframe with a mounting paddle;

dispensing a cyanoacrylate adhesive material on the mounting paddle;

placing the die in contact with the adhesive material; and

35 polymerizing the adhesive material to form a cured adhesive layer and bond the die to the leadframe.

7. The method as claimed in claim 6 wherein the cyanoacrylate adhesive comprises a monomer with a formula:



10 wherein R comprises a hydrocarbon group.

9' Continued

8. The method as claimed in claim 6 wherein the dispensing step comprises a method selected from the group consisting of syringe dispensing, stenciling, dip coating, spraying, and dot shooting.

15

9. The method as claimed in claim 6 wherein dispensing the adhesive material comprises forming a pattern of dots.

20 10. The method as claimed in claim 6 further comprising adding a constituent to the adhesive selected from the group consisting of electrically conductive fillers, electrically insulating fillers, reinforcement fillers, catalyst fillers, heat conductive fillers, moisture resistance fillers and thermal stability fillers.

25

11. The method as claimed in claim 6 wherein the polymerizing step is initiated by condensed ambient humidity present on the leadframe.

30

12. A method for attaching a lead-on-chip semiconductor die to a lead-on-chip leadframe:

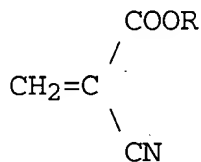
providing the leadframe with a plurality of lead fingers configured to form a die mounting area;

35 dispensing a cyanoacrylate adhesive material on the lead fingers in the die mounting area, said adhesive material comprising an electrically insulating filler;

placing the die in contact with the adhesive material;
and
polymerizing the adhesive material to form a cured
adhesive layer and bond the die to the lead fingers.

13. The method as claimed in claim 12 further
comprising applying a catalyst to the lead fingers, die or
adhesive material prior to the placing step.

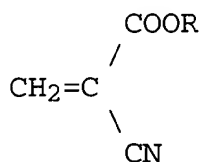
14. The method as claimed in claim 12 wherein the
cyanoacrylate adhesive comprises a monomer with a formula:



wherein R comprises a hydrocarbon group.

15. A method for attaching a semiconductor die to a
leadframe comprising:

providing an adhesive comprising a cyanoacrylate monomer
having a formula:



wherein R is a hydrocarbon group;

dispensing the adhesive on the leadframe or die;
pressing the die against the leadframe with the adhesive
compressed therebetween; and

curing the adhesive at a room temperature and ambient
atmosphere to form a cured adhesive layer and bond the die to
the leadframe.

16. The method as claimed in claim 15 further comprising applying a catalyst to the leadframe, die or adhesive prior to the pressing step.

5 17. The method as claimed in claim 15 further comprising providing the adhesive with a constituent selected from the group consisting of electrically conductive fillers, electrically insulating fillers, reinforcement fillers, catalyst fillers, heat conductive fillers, moisture resistant fillers and thermal stability fillers.

10 18. The method as claimed in claim 15 wherein the leadframe comprises a mounting paddle for the die.

15 19. The method as claimed in claim 15 wherein the leadframe comprises a lead-on-chip leadframe.

20 20. The method as claimed in claim 15 wherein the dispensing step comprises a method selected from the group consisting of syringe dispensing, stenciling, dip coating, spraying, and dot shooting.

25 21. A method for attaching a semiconductor die to a leadframe comprising:

25 providing an adhesive comprising an anaerobic acrylic; dispensing the adhesive on the leadframe or die; pressing the die against the leadframe with the adhesive compressed therebetween; and

30 curing the adhesive at a room temperature and ambient atmosphere to form a cured adhesive layer and bond the die to the leadframe.

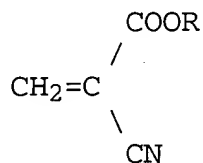
35 22. The method as claimed in claim 21 further comprising providing the adhesive with a constituent selected from the group consisting of electrically conductive fillers, electrically insulating fillers, reinforcement fillers,

al) catalyst fillers, heat conductive fillers, moisture resistance fillers and thermal stability fillers.

23. A semiconductor package comprising:
5 a leadframe;
a semiconductor die bonded to a portion of the leadframe; and
an adhesive layer formed between the portion of the leadframe and the die to bond the die to the leadframe, said
10 adhesive layer formulated to cure at a room temperature in from about 0.25 seconds to 60 seconds.

24. The package as claimed in claim 23 wherein the adhesive layer comprises a material selected from the group
15 consisting of cyanoacrylates, anaerobic acrylics or the like.

25. The method as claimed in claim 23 wherein the adhesive layer comprises a cyanoacrylate monomer with a formula:



25 wherein R comprises a hydrocarbon group.

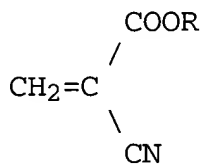
26. The package as claimed in claim 23 wherein the portion of the leadframe comprises a mounting paddle.

30 27. The package as claimed in claim 23 wherein the portion of the leadframe comprises a plurality of lead fingers of a lead-on-chip leadframe.

28. The package as claimed in claim 23 wherein the
35 adhesive layer further comprises a constituent selected from the group consisting of electrically conductive fillers, electrically insulating fillers, reinforcement fillers,

catalyst fillers, heat conductive fillers, moisture resistance fillers and thermal stability fillers.

- 5 29. A semiconductor package comprising:
a singulated portion of a leadframe including a mounting
paddle and a plurality of trimmed lead fingers;
a semiconductor die attached to the mounting paddle; and
an adhesive layer formed between the mounting paddle and
10 the die, said adhesive layer comprising a cyanoacrylate
monomer having a formula:

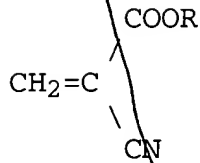


wherein R is a hydrocarbon group.

- 20 30. The package as claimed in claim 29 further
comprising a catalyst applied to the leadframe or die.

31. The package as claimed in claim 29 wherein the
adhesive layer further comprises a constituent selected from
25 the group consisting of electrically conductive fillers,
electrically insulating fillers, reinforcement fillers,
catalyst fillers, heat conductive fillers, moisture
resistance fillers and thermal stability fillers.

- 30 32. A semiconductor package comprising:
a singulated portion of a lead-on-chip leadframe
including a plurality of lead fingers;
a semiconductor die attached to the lead fingers; and
an adhesive layer formed between the lead fingers and
35 the die, said adhesive layer comprising a cyanoacrylate
monomer having a formula:



wherein R is a hydrocarbon group.

33. The package as claimed in claim 32 further comprising a catalyst applied to the leadframe or die.

34. The package as claimed in claim 32 wherein the adhesive layer further comprises a constituent selected from the group consisting of electrically conductive fillers, electrically insulating fillers, reinforcement fillers, catalyst fillers, heat conductive fillers, moisture resistance fillers and thermal stability fillers.

35. A system for attaching a semiconductor die to a leadframe comprising:

an adhesive selected from the group consisting of cyanoacrylate adhesives, anaerobic acrylics or the like;

a dispensing mechanism for dispensing the adhesive on the leadframe or die; and

a die attach mechanism for positioning and placing the die in contact with dispensed adhesive to form a cured adhesive layer for bonding the die to the leadframe.

36. The system as claimed in claim 35 wherein the dispensing mechanism comprises a mechanism selected from the group consisting of syringes, stenciling apparatus, dip coating apparatus, spraying apparatus, and dot shooting apparatus.

37. The system as claimed in claim 35 wherein the adhesive further comprises a constituent selected from the group consisting of electrically conductive fillers, electrically insulating fillers, reinforcement fillers,

catalyst fillers, heat conductive fillers, moisture resistance fillers and thermal stability fillers.

5 38. A system for attaching a semiconductor die to a leadframe comprising:

an adhesive selected from the group consisting of cyanoacrylate adhesives, anaerobic acrylics or the like;

10 a lead on chip die attacher configured to align the die with a portion of the leadframe and to press the die against the leadframe; and

a dispensing mechanism operably associated with the die attacher and configured to dispense the adhesive onto the portion of the leadframe or the die.

15 39. The system as claimed in claim 38 wherein the leadframe comprises a lead on chip leadframe.

add
a2

20